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Article

Neutral/Neutrality are parts of the generic group called Indeterminacy

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Abstract: In this short note we show that C. Ardil's assertation "neutrality is frequently interpreted as a manifestation of the indeterminacy component" is false. We have showed from the beginning in 1998 that "Neutrosophy is a new branch of philosophy, which studies the origin, nature, and scope of **neutralities**, as well as their interactions with different ideational spectra" [1].
His Score-Based Ranking for Neutrosophic Logic is wrong [3] and his Neutrosophic Conjunction and Neutrosophic Disjunction operators are superficial (reduced only to min/max operations), while the Neutrosophic Logic Operators are based on T-norm and T-conorm and have a general form.

Neutral Set/Logic, that uses only neutrality, is a subclass of the Neutrosophic Set/Logic, that uses both neutrality and all types of indeterminacies.

Keywords: Neutrosophy, Neutrality, Single-Valued Neutrosophic Set, Neutral Set, neutrosophic logic, neutrosophic set theory, mathematical equivalence, indeterminacy, truth membership, falsity membership, paraconsistent information, uncertainty modeling.

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1. Introduction

In [3] C. Ardil asserts: Neutrosophic Logic and related neutrosophic set theories have emerged as influential frameworks for representing uncertainty, inconsistency, incompleteness, and indeterminacy. Within this paradigm, neutrality is frequently interpreted as a manifestation of the indeterminacy component. This paper re-examines that assumption from philosophical, ontological, and mathematical perspectives."

2. Etymology and Definition of Neutrosophy ([1], p. 16, 1998)

A) Etymology: Neutro-sophy [French neutre < Latin neuter, neutral, and Greek sophia, skill/wisdom] means knowledge of neutral thought.
B) Definition: Neutrosophy is a new branch of philosophy, which studies the origin, nature, and scope of **neutralities**, as well as their interactions with different ideational spectra.
We have clearly explained in 2021 on the paper [2] that:

"Indeterminacy" is just a generic name for everything that exists in between the opposites <A > and <antiA>,
it is not strictly (literary) "indeterminacy" (= unclearness).

3. Type of Indeterminacies and Neutralities [2]

"Indeterminacy" is a whole group or class of concepts in between the opposites <A> and <antiA>, and the type of "indeterminacy" depends on each application's space.

For examples (see again the link https://fs.unm.edu/Indeterminacy.pdf):

(Friend, **Neutral**, Enemy), Indeterminacy = Neutral (in this case)

(Proton, **Neutron**, Electron), Indeterminacy = Neuron

(Win, **Tie-game**, Lose), Indeterminacy = Tie-game

(Matter, Unmatter, Antimatter), Indeterminacy = Unmatter

(Male, Transgender, Female), Indeterminacy = Transgender

(Small, Medium, Tall), Indeterminacy = Medium

(White, Red, Black), in this case Indeterminacy = Red

(True, Partially-true & Partially-false, False), in this case
Indeterminacy = Partially-true & Partially-false

"The most general definition, the classification, and many real examples of Indeterminacies from our everyday life, utilized in the neutrosophic theories and their applications, are presented below in an understandable manner. **"Indeterminacy" should not be taken into the narrow sense of a lexical dictionary, but as something that is in between the opposites**.

Because of dealing with various types of indeterminacies (vague, unclear, uncertain, conflicting, incomplete, hesitancy, **neutrality**, unknown, etc.) related to the data or to the procedures employed in our real world, we may extend by neutrosophication any classical scientific or cultural crisp concept from any field of knowledge to a corresponding neutrosophic (un-crisp) concept, since in our world more things are indeterminate or partially indeterminate than completely determinate.

Firstly, let's define the neutrosophic triplets. Let be an item (concept, notion, idea, sentence, theory etc.) <A> and its opposite <antiA>. In between the opposites <A> and <antiA>, there is a **neutral** (or indeterminacy) part, denoted by **<neutA>**.
The <neutA > is neither <A> nor <antiA>,
or sometimes the <neutA> is a mixture of partial <A> and partial <antiA>. [2]

Of course, we consider the neutrosophic triplets (T, I, F) that make sense in the world, and there are plenty of such triplets in our everyday life [1].

4. Score Function for Neutrosophic Logic [4]

It is defined as:

$s(T,I,F) = [T+(1-I)+(1-F)]/ 3 = [2+T-I-F] / 3$

and represents the average of positiveness of the single-valued neutrosophic components T, I, F, where T is considered of positive quality, while I and F of negative quality which implies that 1 – I and 1- F are of positive quality.

Ardil's (actually AI's) Scor Function, defined as

$s(T, I, F) = T - F$

is wrong, because the component I is completely ignored.

And, by the way, only the Score Function is not enough in order to get a total order on the set of triplets (T, I, F), two more functions are needed:
Accuracy Function and Certainty Function [see 4].

5. Neutrosophic Conjunction and Neutrosophic Disjunction

C. Ardil uses only min/max for these operators, which is superficial, since the Neutrosophic Conjunction and Disjunction are based more generally on T-norm and T-conorm.
About applying min/max/max or min/min/max (and similarly for max/min/min or max/max/min) it depends to where is indeterminacy/neutrality I close to, either much close to F, or respectively much closer to T.

Neutral Set/Logic, that uses only neutrality, is a subclass of the Neutrosophic Set/Logic, that uses both neutrality and all types of indeterminacies.

> C. Ardil uses AI and generates mill papers daily. But, asking vague or fake questions to AI, he receives vague or fake answers.

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